Methomyl - an ovicide for control of *Heliothis spp*. in a cotton pest management system

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Native budworm Heliothis punctigera Wall and cotton bollworm Heliothis armigera Hubn are the most damaging pests of cotton in Australia. Current insecticide spray programmes are directed primarily at the control of the early larval stages. Chemicals with ovicidal activity offer considerable advantages in reducing viable egg numbers and thereby the percentage larval hatch. Laboratory and field studies with methomyl conducted overseas have shown this product to be a highly effective ovicide.

This paper summarises two experiments carried out in the cotton growing district of Wee Waa. New South Wales, Australia in which the ovicidal activity of low rates of methomyl (112.5 and 225 g/ha^{-1}) was compared with that of chlordimeform (500 g/ha^{-1}). Heliothis eggs, freshly laid on paper towelling by caged females (H. punctigera:H. armigera::5:1) were collected by immersing the towelling in a 0.2% solution of sodium hypochlorite, brushing the eggs into the solution using a soft art brush and separating them out onto black muslin cloth through a Buchner funnel. Infertile eggs tended to float to the surface and were discarded. One hundred and eighty eggs (20 eggs x 9 terminals) ware placed in each treatment block (0.48 ha^{-1}) using an art brush dipped in agar (0.1%). Egg placements and datum plants were marked for identification. Insecticide treatments were applied in 22L/ha^{-1} by aircraft (Cessna Ag Wagon) equipped with 4 micronair cages. Eggs were collected for laboratory examination by cutting a 2 cm leaf disc around "tagged" eggs and placing these in plastic cups on pieces of moistened cotton-wool covered with aluminium foil.

Methomyl at both rates and chlordimeform were equally effective (p = 0.05). 66%-99% of eggs were prevented from hatching (ovicidal activity) and larvae which emerged from treated eggs were controlled (larvicidal activity), (Table 1). These activities combined gave almost a complete kill of the original population compared to the laboratory controls (66.1%-75.6%).

TABLE 1. Summarised Data: % Egg Hatch, % Larval Mortality and % Total Mortality

Treatments (g/ha^{-1})	Egg Hatch (%)		Larval Mortality(%)		Total Mortality(%)	
	Expt 1+	Expt 2*	Expt 1	Expt 2	Expt 1	Expt 2
Methomyl 112.5	33.9 b	10.0 a	88.2 a	100.0 a	94.4 a	100.0
Methomyl 225	11.1 a	9.4 a	90.0 a	100.0 a	98.3 a	100.0
Chlordimeform 500	20.0 ab	8.9 a	100.0 a	100.0 a	92.2 a	99.4
Lab. Control	54.4 c	45.5 b	39.5 b	67.8 b	66.1 b	75.6
LSD 5%	15.3	14.9	19.9	12.6	10.1	5.7

Figures followed by the same letter are not significantly different at 5% level. + Cumulative figure over 4 days, * cumulative figure over 6 days.

The experiments reported in this paper show that methomyl at low rates is an active ovicide on Heliothis spp. eggs. It could therefore become a valuable component of pest management strategies in cotton crops; either used on its own during periods of low egg pressure or in combination with cost/efficient larvacides during peak egg lay periods.